MUC-1 TUMOR ANTIGEN AGONIST EPITOPES FOR ENHANCING T-CELL RESPONSES TO HUMAN TUMORS

SUMMARY

Scientists at NIH have identified 7 new agonist epitopes of the MUC-1 tumor associated antigen. Compared to their native epitope counterparts, peptides reflecting these agonist epitopes have been shown to enhance the generation of human tumor cells, which in turn have a greater ability to kill human tumor cells endogenously expressing the native MUC-1 epitope.

REFERENCE NUMBER

E-001-2012

PRODUCT TYPE

- Therapeutics

KEYWORDS

- antigen
- agonist
- epitope
- MUC-1

COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

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DESCRIPTION OF TECHNOLOGY

The MUC-1 tumor associated antigen has been shown to be overexpressed and/or underglycosylated in a wide range of human cancers. The C-terminus region of MUC-1 (MUC-1C) has been shown to be an oncogene and has been associated with a more aggressive phenotype in several different cancers.

Scientists at NIH have identified 7 new agonist epitopes of the MUC-1 tumor associated antigen. Compared to their native epitope counterparts, peptides reflecting these agonist epitopes have been shown to enhance the generation of human tumor cells, which in turn have a greater ability to kill human tumor cells endogenously expressing the native MUC-1 epitope. The agonist epitopes span both the

VNTR region of MUC-1 and the C-terminus region. The epitopes encompass 2 major MHC alleles reflecting the majority of the population.

Along with the method of use, the technology encompasses the use of these agonist epitopes in peptide- and protein-based vaccines, with dendritic cells or other antigen presenting cells, or encoding sequences in DNA, viral, bacterial, yeast, or other types of vectors, or to stimulate T-cells in vitro for adoptive immunotherapy protocols.

POTENTIAL COMMERCIAL APPLICATIONS
- As a therapeutic vaccine to enhance patient's immune responses to a range of human cancers
- As a preventive vaccine for patients with preneoplastic conditions or a high risk of developing cancer
- As a preventive vaccine for cancers
- For in vitro stimulation of lymphocytes for adoptive transfer protocols for cancer

COMPETITIVE ADVANTAGES
- The agonist epitopes have been shown to be much more potent than their natural counterparts in activating human T-cells to MUC-1.
- Compared to T-cells activated with the corresponding native epitopes, the T-cells activated by the agonist epitopes lyse tumor cells to a greater extent.
- The technology can be used in a wide range of cancer vaccine platforms and in adoptive immunotherapy protocols.
- The technology can be combined with existing vaccine platforms including those currently showing patient benefit, as well as with other therapeutic modalities.

INVENTOR(S)

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DEVELOPMENT STAGE
- Discovery (Lead Identification)

PATENT STATUS
- **U.S. Filed:** PCT Application No. PCT/US2013/020058 filed (01/03/2013)

THERAPEUTIC AREA
- Cancer/Neoplasm